Chemical stimulation.—STEINBERG[12] has reported on further studies on the chemical stimulation of growth in *Aspergillus niger*, especially as brought about by Zn and Fe salts. Pfeffer's nutrient solution was used as the basis of all cultures. Commercial reagents, without further purification, were used in making solutions. It was found that 0.1 to 1.0 mg. Zn per liter was sufficient to furnish maximum stimulation, the growth thus stimulated averaging about four times that of the check. Successively lessening the amounts of each of the inorganic constituents of the solution resulted in all cases in decreased yield, showing none of them present in toxic or super-optimum concentration. Increasing the concentration of the various salts stimulated growth, although to a much less extent than that caused by Zn. Decreasing the acidity by adding alkalis decreased growth and gave strong spore formation. Increasing the H ion concentration by adding various acids stimulated vegetative growth and decreased spore formation. The type of growth resulting from increasing H ion concentration was very similar to that following Zn stimulation, but was always less in amount. STEINBERG believes the H ion concentration of Pfeffer's solution to be sub-optimum for *A. niger*, and suggests that the increased acidity of the solution with the addition of salts of the heavy metals with strong acids may be a very important factor in the stimulation to greater growth.

The Pfeffer solution was purified by autoclaving with $CaCO_3$ to precipitate Zn and other bivalent metals. Growth in such solutions was much less than in those not purified. Either Zn or Fe added alone stimulated growth somewhat, but not nearly so much as when both were added. Growth in the latter case was equal to that in any of the non-purified Zn stimulated cultures. STEINBERG believes previously secured stimulation from Zn alone to have been in the presence of Fe impurities.

No analyses were made to determine the chemical changes associated with the marked variation in growth rate and form brought about by the variation in the nutrient solution. Such data would be most interesting. It is unfortunate that reagents were not sufficiently repurified to eliminate entirely the possibility of Zn, Fe, Ni, and other such metals in the basic nutrient solution.—J. R. MAGNESS.

Mangroves.—Among the interesting features of a study of the red mangrove, *Rhizophora Mangle*, by BOWMAN,[13] is a synopsis of the historical development of our knowledge of the tree. The literature dates from 325 B.C. to the present, and includes references by THEOPHRASTUS, PLINY, PLUTARCH, BAUHIN, RAY, LINNAEUS, and LAMARCK, as well as more recent writers.

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[12] STEINBERG, R. A., A study of some factors in the chemical stimulation of the growth of *Aspergillus niger*. Amer. Jour. Bot. **6**:330–372. 1919.

[13] BOWMAN, H. H. M., Ecology and physiology of the red mangrove. Proc. Amer. Phil. Soc. **56**:589–672. *pls. 9*. 1917.

The investigations of BOWMAN were in the Dry Tortugas, and include many details regarding the morphology and structure of the various organs of the tree, including development and growth rate of the viviparous embryos. Measurements of the latter show a 4.7 cm. elongation of the emerging hypocotyls in 34 days. The results of transpiration studies show a lower rate of water loss with higher concentrations of sea water. The red mangrove is facultative in its growth in fresh and salt water, but requires the latter for optimum development. At least 2000 sq. miles of the tidal flats of the Philippine Islands are occupied by mangrove forests. The floristic, ecological, and economic characteristics of these forests of the sea have been described by BROWN and FISCHER.[14] Keys are provided for the recognition of the 30 principal species belonging to 16 different families. In addition to the well known aerial roots and viviparous habit of the mangroves, some of the notable features of these woodlands are the scanty undergrowth, the fairly numerous epiphytes, the myrmecophilous plants, and the frequent fringing of Nipa palms.

While the original stands of this forest contain trees of fair size yielding hard cabinet woods of excellent quality, the greater portion of the area is important only for the production of a good quality of firewood and for tan bark. The Nipa palm is important for alcohol production, and seems to present a possibility of utilization for sugar. Some cultivation of both the mangroves and the Nipa palms has proved successful; the former has also been used with good results in planting dykes and embankments to prevent the erosive action of the sea.—GEO. D. FULLER.

Age and area hypothesis.—The development of this hypothesis by WILLIS has been noted in this journal,[15] and now an analysis of the flora of New Zealand seems to strengthen his contentions.[16] The evidence in favor of the majority of endemics being of recent origin rather than relics is rather convincing.

Recently a floristic study of the plants of Stewart Island[17] yielded results supporting the hypothesis of the families and genera being represented in proportion to the number of genera and species respectively contained in them in New Zealand. The oldest forms are best represented in the flora, and the endemics are in the largest (in general, oldest) families and genera of New Zealand.

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[14] BROWN, WM. H., and FISCHER, A. F., Philippine mangrove swamps. P.I. Dept. Agric. and Nat. Res., Bur. For. Bull. **17**:132. *pls. 47*. 1918.

[15] BOT. GAZ. **61**:82. 1916; **62**:160. 1916; **63**:419. 1917; **64**:263. 1917; **65**: 116–117, 486. 1918.

[16] WILLIS, J. C., The sources and distribution of the New Zealand flora, with a reply to criticism. Ann. Botany **32**:339–367. 1918.

[17] ———, The flora of Stewart Island (New Zealand): a study in taxonomic distribution. Ann. Botany **33**:23–46. 1919.